



US005668867A

# United States Patent [19]

## Nagai

[11] Patent Number: 5,668,867

[45] Date of Patent: Sep. 16, 1997

[54] FOLDABLE PORTABLE TELEPHONE WITH IMPROVED ANTENNA GAIN

[75] Inventor: Michio Nagai, Tokyo, Japan

[73] Assignee: NEC Corporation, Tokyo, Japan

[21] Appl. No.: 723,508

[22] Filed: Sep. 30, 1996

### Related U.S. Application Data

[63] Continuation of Ser. No. 356,674, Dec. 15, 1994, abandoned.

### [30] Foreign Application Priority Data

Dec. 28, 1993 [JP] Japan ..... 5-335116

[51] Int. Cl.<sup>6</sup> ..... H04M 1/00; H04B 1/38

[52] U.S. Cl. .... 379/433; 379/428; 379/434; 455/90

[58] Field of Search ..... 379/433, 434, 379/428, 424, 425; 455/89, 90; 361/814

### [56] References Cited

#### U.S. PATENT DOCUMENTS

5,260,998 11/1993 Takagi .

5,335,368 8/1994 Tamura ..... 455/90

### FOREIGN PATENT DOCUMENTS

0 536 578	4/1993	European Pat. Off. .	
136457	7/1985	Japan .....	379/425
4-137948	5/1992	Japan .....	379/428
2 254 519	10/1992	United Kingdom .	

Primary Examiner—Jack K. Chiang

Attorney, Agent, or Firm—Young &amp; Thompson

### [57] ABSTRACT

A foldable portable telephone is made up of an upper casing having a receiver portion, and a lower casing having a transmitter portion. The lower casing is rotatably connected to the upper casing by a hinge. When the lower casing is rotated away from the upper casing, the receiver portion is moved to protrude from the upper casing. At this instant, the telephone is brought into an off-hook state. When the lower casing is rotated onto the upper casing, the receiver portion is retracted into the upper casing while the telephone is brought into an on-hook state. The receiver portion, when protruded from the upper casing, increases the distance between an antenna and the user's ear. In this condition, the antenna is not influenced by the user's body and, therefore, maintains a sufficient antenna gain.

5 Claims, 6 Drawing Sheets

